UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
CONVERSATION RECORD

DATE: March 27, 1997

SUBJECT: Metropolitan Wastewater Treatment Plant, St. Paul, MN
PM-10 Emissions

FROM: Sarah Miller, Environmental Scientist SM
Enforcement and Compliance Assurance Section (MN/OH)
Air Enforcement and Compliance Assurance Branch

TO: File

Background

I contacted Jim Brown, Principle Process Engineer at the Metropolitan Council Metropolitan Wastewater Treatment Plant (Metro), to obtain an update of the activities at Metro since the time of my September 1996 inspection and discuss issues related to PM-10 emissions at Metro.

Summary of call

I discovered that Mr. Brown's number has changed from (612) 772-7222, to (612) 602-8222. The general number at Metro has remained (612) 771-8845.

After introducing myself, I explained that I had some general questions and that I was concerned about the continued damage leakage as reported in the 1996 PM-10 report.

During the time of my inspection, Metro had added new refractory material and a new gasket holding system on the emergency dampers on incinerators 5 and 7 in an attempt to halt leakage of uncontrolled flue gas past the dampers to the atmosphere through the emergency stacks. Mr. Brown stated that similar changes have now been made to the other emergency dampers (incinerators 5-10); however, he stated that the changes have not been successful in preventing leakage of flue gas into the emergency stacks. He reported that Metro was continuing to combat leakage through instructing incinerator operators to maintain a high (negative) draft in hearth 0 of each of the incinerators. Under these conditions, outside air from the emergency stacks is brought into the incinerator, but uncontrolled flue gas is prevented from traveling out to the atmosphere.

The Metro 1996 PM-10 report indicates a high quantity of PM-10 leakage emissions in November and December 1996. Mr. Brown stated that these emissions were primarily from incinerators 9 and 10. During my September inspection, the center shaft cooling air from incinerator 10 had been temporarily ducted to exit out of the emergency stack of incinerator 9. The center shaft cooling air from incinerator 10 was designed to exit out of the emergency stack for incinerator 10; however, the presence of the 220°F, 5000 cfm, center shaft air in the emergency stacks of incinerators 9 and 10 created a lower pressure in these emergency stacks which was more difficult to

overcome. To minimize this problem, Metro had ducted the center shaft cooling air from incinerator 10 (as well as that from incinerator 9) out of the emergency stack of incinerator 9. The center shaft cooling air is building air which is taken into the rabble arms at the bottom of the incinerator to circulate through and cool the arms; the air does not contain flue gas.

Mr. Brown stated that the temporary ductwork failed in November 1996. As a result, the cooling shaft air of incinerator 10 was returned to exiting the building through the emergency stack of incinerator 10. Mr. Brown reported that this situation increased the damper leakage and that elevated levels are present through the first part of March 1997. He stated that permanent ductwork changes have recently been completed such that the center shaft cooling air from incinerator 10 is removed from the emergency stack and instead travels to the outside through its own separated ductwork which comes off the top of the incinerator. Mr. Brown stated that similar changes are being made currently to incinerator 9. He was hopeful that these changes would reduce the quantity of emissions to the April - June 1996 levels (977 - 1228 lbs PM-10/month for all six incinerators).

I verified that the uncontrolled PM-10 emission rate used in the annual reports from Metro are 2.2 lbs/min. Mr. Brown stated that this figure was based on analysis done by the University of Minnesota Particle Technology Lab in 1990. He stated that the Lab found that the total particulate emissions during normal load conditions was about 7.4 lbs/min and that PM-10 emissions comprised approximately 30% of the total, or 2.2 lbs/min. He pointed out that the AP-42 lists an uncontrolled PM-10 emission rate of 8.2 lbs/dry ton of sludge incinerated and the figure that Metro uses corresponds to 55 lbs PM-10/dry ton of sludge incinerated.

Mr. Brown also verified that the reported leakage past the dampers is estimated to be 0.22 lbs PM-10/min (10% of total uncontrolled). He stated that CO mass balances performed earlier indicated that the leakage was actually about 3% during a "worst-case" condition when the pressure differential between hearth 0 and the emergency stack was about -0.2" H_2O, rather than the -0.1" H_2O differential that Metro strives to maintain.

In answering my question, Mr. Brown stated that damper leakage does not necessarily directly follow a damper opening. He stated that the dampers never seem to seal completely and so leakage occurrence is dependent upon the draft in the emergency stack. In addition to the historical presence of center shaft cooling air in the emergency stacks of incinerators 9 and 10, wind blowing across the top of the emergency stacks causes a draft inside all of the stacks which is difficult to overcome by altering the draft on hearth 0. Mr. Brown stated that Metro has constructed a scale model of the emergency stack and performed tests aimed at minimizing the effects of strong winds inside the emergency stacks. He thinks that Metro may explore adding air into the emergency stack to eliminate the pull on the emergency damper caused by the wind-driven pressure drop within the emergency stacks.

Mr. Brown verified that each incinerator has its own ID fan and that no backup fans exist. He stated that damper openings occur when there is a problem with the air pollution control train and admitted that this is

typically due to a problem with the fan (can't maintain a negative draft, motor overheats, etc....) but can also be caused by a loss of water flow to the scrubbers, or other reasons. He stated that feed to the incinerator automatically shuts off when the damper opens. The damper opening can be as short as 2-3 seconds. Mr. Brown stated that these short openings might occur when the fan has not been able to maintain a negative draft, but after the pressure dump caused by the damper opening, the fan maybe able to regain power. He stated that industry belief is that it takes 25-30 minutes for the remaining sludge to burn out of the incinerator once the feed has stopped. He stated that Metro assumes that 45 minutes is required and continues to report PM-10 emissions of 2.2 lbs/min for the entire 45 minutes that a damper is opened even though the emissions would actually taper down during that period.

Mr. Brown stated that when a damper remains open for more than 45 minutes, only the first 45 minutes are reported in the PM-10 annual report because no emissions are believed possible after that time due to the lack of feed. The incinerator burners may or may not remain fired during the entire damper opening depending on the amount of time expected to get the control train on-line again. Because uncontrolled emissions are assumed to last 45 minutes at most, Metro has not contacted MPCA when the damper is opened for an hour or longer. Metro's AO states that Metro must contact the MPCA by the next working day when a breakdown of more than one hour duration of control equipment occurs that causes an increase to the emissions of PM-10.

I asked Mr. Brown when the N-Viro Soil and Nutralime processes I observed in September at Metro began. He said that he thought both had been on-site for approximately 5 years. I said I was concerned that these potential PM-10 sources did not appear in the AO or any other permits. He suggested that I contact Rebecca Flood, Manager of Regulatory Compliance, at (612) 229-2073, or her air employee, Melba Hensel at (612) 229-2072 to discuss that matter.

I verified that the major changes between the failed particulate stack test on incinerator 7 (June 18, 1996) and the compliant re-test (September 18, 1996) was the replacement of the mist eliminator unit and the silencer replacement. Mr. Brown stated that the new style mist eliminator mesh pads that we had discussed in September were installed in incinerator 5 three weeks ago and will be installed in all the incinerators if determined successful. Mr. Brown stated that they are currently planning the 1997 stack tests and will soon meet with MPCA to discuss. He believes that the tests will begin in late May.

I noted that the 4th quarter 1996 excess emission reporting style had not changed to reflect the actual magnitude of the excess emissions (rather than $\geq$ 20% per my request during the inspection. Mr. Brown stated that he had forwarded the message to his management, but was told that their current style of reporting was sufficient. He suggested that I discuss the matter with Rebecca Flood.

I also inquired about the Operation and Maintenance Plan that I had requested during the inspection. Mr. Brown stated that he had found it the

following day and thought that he had forwarded it to me. I gave him my address and requested that he resend the information because I have not received any information. I also requested that he include the PM-10 emissions reporting for January to March 1997. He promised to send the information within a week.

Required Action

Contact Rebecca Flood.